ADGIL DESIGN INC.

9800 series

DIRECTOR

User Manual

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Table of Contents

1 INTRODUCTION 5
1.1 OVERVIEW 5
1.2 GLOSSARY OF ABBREVIATIONS 6
2 MAINFRAME 7
2.1 REAR PANEL 7
2.2 I/O CARDS 7
2.2.1 9806 INTERFACE CARD. Slot 18. 8
2.2.2 9803A INSERT SEND CARD. Slot 11. 8
2.2.3 9803A-MET METER FEED CARD. Slot 16. Optional. 8
2.2.4 9804A INSERT RETURN CARD. Slot 12. 8
2.2.5 9805C-M MASTER OUTPUT CARD. Slot 13. 9
2.2.6 9805C-S SLAVE OUTPUT CARD. Slot 14. 9
2.2.7 9808 8 CHANNEL MATRIX INPUT CARD. Slots 1 to 10. 10
2.2.8 9814 DOWNMIX / SOLO INPUT CARD. Slot 15. Optional. 10
2.3 FRONT PANEL 12
3 MENU SYSTEM (Release 4.XX) 13
3.1 SET UP SELECT MENU .REM. 13
3.1.1 Procedure 13
3.2 MATRIX INPUT BUSS ASSIGNMENT MENU .REM. 13
3.2.1 Procedure 14
3.3 SOURCE MENU .REM. 14
3.3.1 Procedure 14
3.4 DIM Default 18.0 dB 16
3.4.1 Procedure 16
3.5 SPLA Default -6.000 dB 16
3.5.1 Procedure 16
3.6 SPLB Default -12.000 dB 16
3.6.1 Procedure 16
3.7 SPLA REFERENCE Default : 85 17
3.7.1 Procedure 17
3.8 MONO INPUT .REM. 17
3.8.1 Procedure 17
3.9 MONO OUT .REM. 17
3.9.1 Procedure 17
3.10 EXTSOLO1 OUT 18
3.10.1 Procedure 18
3.11 EXTSOLO1 CONTROL 18
3.11.1 Procedure 18
3.12 EXTSOLO2 OUT 18
3.12.1 Procedure 19
3.13 EXTSOLO2 CONTROL 19
3.13.1 Procedure 19
3.14 CHANNEL ENABLE 19
3.14.1 Procedure 19
3.15 GROUP MODE 20
3.15.1 Procedure 20
3.16 WILD GROUP MODE 20
3.16.1 Procedure 20
3.17 GROUP ASSIGNMENT (WILD, PEC, DIR) .REM. 20
3.17.1 Procedure 20
3.18 SPKRA GPI 21
3.18.1 Procedure 21
3.19 CUE GPI 21
3.19.1 Procedure 21

3.20 SETUP COPY MENU 21
3.20.1 Procedure 21
4 9840 REMOTE CONTROL 22
4.1 OVERVIEW 22
5 9840 REMOTE CONTROL PROGRAMMABLE FUNCTIONS 24
5.1 SOURCE AND BUSS ASSIGN 24
5.1.1 Procedure 24
5.2 MONO INPUT AND OUTPUT ASSIGN 24
5.2.1 Procedure 25
5.3 MEMORY SETUP SELECTION 25
5.3.1 Procedure 25
5.4 PEC 26
5.4.1 Procedure 26
5.5 DIR 26
5.5.1 Procedure 26
5.6 WILD 26
5.6.1 Procedure 26
6 9840 REMOTE CONTROL FUNCTIONS 27
6.1 SOURCE KEYS 1 through 16 27
6.1.1 Selecting a source 27
6.1.2 Soft grouping 27
6.1.3 Group mode enabled 27
6.2 SHIFT KEY 27
6.3 WILD KEY 28
6.4 ENABLE KEYS 28
6.5 SPKRA Key 28
6.6 SPKRB Key 29
6.7 SPKRC Key 29
6.8 MONO Key 29
6.9 CUE Key 29
6.10 INSERT Key 29
6.11 CUT Key 30
6.12 DIM Key 30
6.13 SPLA Key 30
6.14 SPLB Key 30
6.15 PEC Key 30
6.16 DIR Key 31
6.17 INPUT LEDS 31
6.18 FINE or COARSE VOLUME CONTROL MODE 31
7 INSTALLATION 32
7.1 CONNECTING TO THE DIRECTOR 32
7.2 CONNECTORS 32
7.2.1 Connectors for I/O Cards 9403A, 9404A, 9805C, 9808, 9814 33
7.2.2 Connector for 9806C Interface card 34
7.2.3 Connector for Remote Control 34
7.2.4 Connecting to the outside world 34
8 LEVEL CALIBRATION 36
8.1 ELECTRONIC LEVELS 36
8.1.1 Procedure 36
8.2 ACOUSTIC LEVELS 37
8.2.1 Procedure 37
9 SPECIFICATIONS 38
9.1 INPUTS 38
9.2 OUTPUTS 38
9.3 DYNAMIC RANGE, HEADROOM AND NOISE 38
9.4 DIMENSIONS 39

10 APPENDICES 40
10.1 Appendix A – Block Diagram 41
10.2 Appendix B – Buss amp Insert send 42
10.3 Appendix C – Meter Feed 43
10.4 Appendix D – Insert Return/Mono 44
10.5 Appendix E – Master output 45
10.6 Appendix F – Slave output 46
10.7 Appendix G – Matrix Intput 47
10.8 Appendix H – Downmix / Solo 48

Table of figures

Figure 1 - Rear Panel 7
Figure 2 – Front Panel 12
Figure 3 – Remote Control 23

1 INTRODUCTION

1.1 OVERVIEW

The DIRECTOR has been designed to be a multi-channel source selector and volume control for monitoring in surround. It can handle from one up to eight speaker channels, making it suitable for mono, stereo, 4 channels (LCRS), 6 channels (5.1) or 8 channels (7.1) monitoring. It has a number of functions that make it very useful in the studio and easy to interface with other equipment.

While working on a specific project, the channel assignment for each piece of equipment must be determined. From that time on, and for the duration of the project, this assignment will remain the same. However, there are several standard channel assignment schemes and some non-standard as well. The input section of the DIRECTOR can be conformed to suit any format. Being a source selector and not a mixing desk, **one** input can only be assigned to **one** speaker at a time. The inputs are derived from the outputs of the various machines containing your mix elements – multitrack tapes, DAWs, etc. For example, if channel 7 of machine #2 is a LEFT channel, the corresponding input of the DIRECTOR, say input #15, will be assigned to the LEFT speaker.

Inputs are selected using a SOURCE button on the remote control. A source can be any combination of inputs that must be selected together, i.e. all 6 channels of a DVD playing in a 5.1 format. The DIRECTOR allows you to have 32 different SOURCE combinations.

Sometimes, it's necessary to listen to more than one source at a time. For example, during a film mixing session, working with stems, you may want to select any one of the stems (music, dialog, effects, ambiance) alone, all together or in any combination. The DIRECTOR lets you group sources together, so that a single button may select these sources.

Furthermore, any input may be part of several sources, but the channel definition (i.e. LEFT) will remain the same for all the sources using this input.

All of the inputs that have been selected by the sources are mixed in eight dedicated busses: Left, Right, Center, Surround Left, Surround Right, Low Frequency Effects, Mid Left and Mid Right. The outputs of these busses are available at the Insert Send and can be used as a final mix combining the stems, or as a send to an external processor (i.e. 4 - 2 - 4 matrix for Dolby Stereo®). There are no level controls in the input section. Any selected input is routed to a buss at unity gain.

The output section of the DIRECTOR lets you control the listening environment with:

- Variable volume control, via a rotary shaft encoder.
- Two programmable preset levels for calibrated listening.
- Mute and Dim (programmable depth).
- Mono check with programmable input, output and level.
- Three speaker systems select: system A (multi-channel), B (stereo) or C (stereo).
- Individual speaker select that can be a mute or a solo.
- Selection of listening to the busses or the insert return.
- External commands for Mute, Dim, Solo (AFL / PFL) from a console.

There are 8 memory setups that can be programmed and stored, each one including every parameter of the DIRECTOR. They can be used to store different channel assignment schemes, listening level preferences, etc.

The signal path of the DIRECTOR remains entirely analog, but is controlled by a microprocessor. Great care has been taken in its design and assembly to ensure the integrity and quality of the sound.

The speaker outputs are protected by relays that are activated only after the unit has stabilized following turn on, and are de-activated if any power related problem is detected. It is safe to turn the unit on or off with live speakers.

The minimalist approach to signal flow, limiting the amount of electronic circuitry that a signal must go through, has led to low power consumption, allowing operation at low temperature without a fan. The power transformer is toroidal, creating extremely low acoustic and electro-magnetic radiation. Thus, this unit can be installed anywhere.

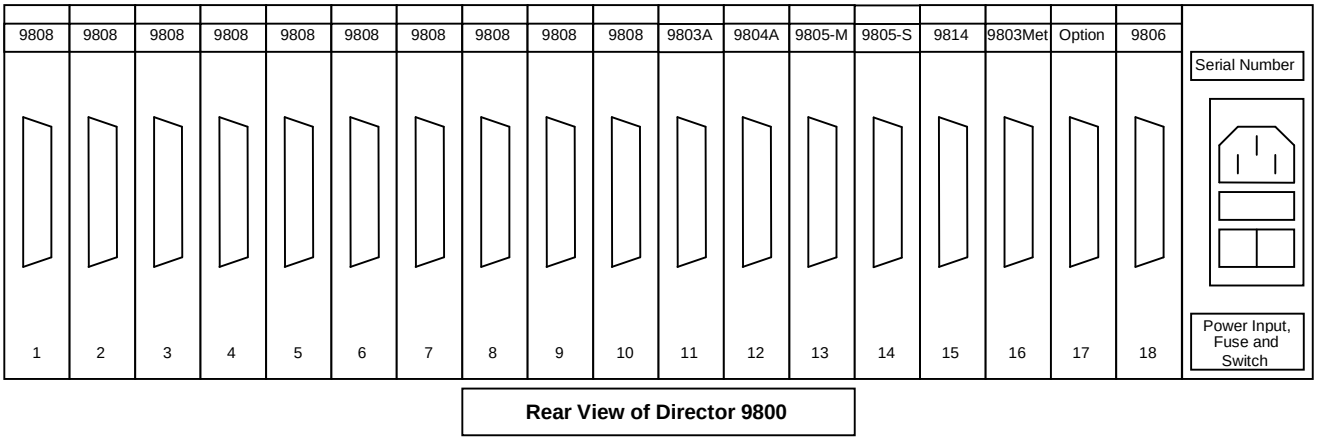
The DIRECTOR has two main components: the Mainframe and the Remote Control. The chassis is a 19" rack unit, 3U high, with a Front Panel for programming, and plug-in cards in the back for the input and output connections. The remote control includes all the functions normally needed for the operation of the unit. It comes standard with a 15 m (50 ft) long cable.

1.2 GLOSSARY OF ABBREVIATIONS

L	Left, usually Front Left Speaker.
R	Right, usually Front Right Speaker.
C	Center, usually Front Center Speaker.
LFE	Low Frequency Effects, dedicated low frequency effects CHANNEL, also called ".1". It is usually reproduced by a Sub-Woofer (specialized low-frequency SPEAKER).
SL	Surround Left, left half of a stereo surround system. Could also be Surround Side Left in a 5.1EX surround system.
SR	Surround Right, right half of a stereo surround system. Could also be Surround Side Right
in a	5.1EX surround system.
ML	Mid Left, could be Inner Left in a 7.1 Film format or Surround Back Left in a 5.1EX surround system.
MR	Mid Right could be Inner Right in a 7.1 Film format or Surround Back Right in a 5.1EX surround system.
S	Surround, Mono Surround in a L-C-R-S surround system (Dolby Stereo® or Dolby Prologic®).
Lo	Left Only, left channel created by a stereo downmix of a multi-channel source.
Ro	Right Only, right channel created by a stereo downmix of a multi-channel source.
DIR	Direct, output of a mixing desk. Could be called "Buss" (as opposed to "Tape") or "A" (as opposed to "B").
PEC	Photo Electric Cell, the play-back of an optical track on film. Could be called "Tape" (as opposed to "Buss") or "B" (as opposed to "A").
DIM	Attenuation of the listening level by a preset amount, to allow for conversation or Talk-Back in the control room or studio.

2 MAINFRAME

Figure 1 - Rear Panel



Rear View of Director 9800

2.1 REAR PANEL

The DIRECTOR mainframe is based on a Euro-rack chassis. The rear panel includes 18 slots for the I/O cards. The power module, on/off switch, fuse holder and the IEC power connector are found at the extreme right.

2.2 I/O CARDS

Each card has an on-board DB25 connector. The pin assignement on all cards conforms to the TASCAM DA88™ format with the exception of the 9806 Interface card. (See Section 7.2.2).

Note: The input connectors on the 9804A and 9808 are female DB25 and the output connectors for 9803A, 9803A-MET, 9805C-M, 9805C-S and 9814 are male DB25.

2.2.1 9806 INTERFACE CARD. SLOT 18.

This card is the interface between the mainframe, the remote control and the studio for all GPI and external commands (cut, solo, dim, etc.). It has an on-board DB25 connector.
Refer to Section 7.2.2 for the pinout of this connector.

2.2.2 9803A INSERT SEND CARD. SLOT 11.

This card includes the eight buss amplifiers. These feed 8 balanced line outputs. Multi-turn trimpots are accessible through openings in the card to calibrate the sends to your equipment. They are, from top to bottom: L, R, C, SL, SR, LFE, ML, MR.
Refer to Section 7.2.2 for the pinout of this connector.

OUTPUT
Channel 1: LEFT
Channel 2: RIGHT
Channel 3: CENTER
Channel 4: SURROUND LEFT
Channel 5: SURROUND RIGHT
Channel 6: LFE
Channel 7: MID LEFT
Channel 8: MID RIGHT

2.2.3 9803A-MET METER FEED CARD. SLOT 16. OPTIONAL.

This card outputs eight channels of audio for metering purposes. "What you see is what you hear!". It is the same signal that feeds the Master and Slave output cards, before level control.
Refer to Section 7.2.2 for the pinout of this connector.

OUTPUT
Channel 1: LEFT
Channel 2: RIGHT
Channel 3: CENTER
Channel 4: SURROUND LEFT
Channel 5: SURROUND RIGHT
Channel 6: LFE
Channel 7: MID LEFT
Channel 8: MID RIGHT

2.2.4 9804A INSERT RETURN CARD. SLOT 12.

This card has 8 balanced line inputs. It also includes the mono-summing amplifier.
Refer to Section 7.2.2 for the pinout of this connector.

INPUT
Channel 1: LEFT
Channel 2: RIGHT
Channel 3: CENTER
Channel 4: SURROUND LEFT
Channel 5: SURROUND RIGHT
Channel 6: LFE
Channel 7: MID LEFT
Channel 8: MID RIGHT

2.2.5 9805C-M MASTER OUTPUT CARD. SLOT 13.

The 9805C-M is the output card for the first 4 channels of your main surround speaker system (SPKR A) – outputs L, R, C and SL. It also contains two auxiliary stereo outputs (SPKR B and SPKR C).
All outputs have multi-turn trimpots, accessible through openings in the card, to enable you to match levels to those of your amplifier system. They are, from top to bottom: L, R, C, SL, for speaker system A. Below the DB25 connector you will find Left, Right trimpots for speaker system B and finally, Left, Right trimpots for speaker system C.
Refer to Section 7.2.2 for the pinout of this connector.

OUTPUT
Channel 1: SPKR A LEFT
Channel 2: SPKR A RIGHT
Channel 3: SPKR A CENTER
Channel 4: SPKR A SURROUND LEFT
Channel 5: SPKR B LEFT
Channel 6: SPKR B RIGHT
Channel 7: SPKR C LEFT
Channel 8: SPKR C RIGHT

2.2.6 9805C-S SLAVE OUTPUT CARD. SLOT 14.

The 9805C-S is the output card for the last 4 channels of your main surround speaker system (SPKR A) – outputs RS, LFE, ML, MR. All outputs have multi-turn trimpots, accessible through openings in the card, to match levels to those of your amplifier system. From top to bottom: SR, LFE, ML, MR.
Refer to Section 7.2.2 for the pinout of this connector.

OUTPUT
Channel 1: SPKR A SURROUND RIGHT
Channel 2: SPKR A LFE
Channel 3: SPKR A MID LEFT
Channel 4: SPKR A MID RIGHT
Channel 5: NOT CONNECTED
Channel 6: NOT CONNECTED
Channel 7: NOT CONNECTED
Channel 8: NOT CONNECTED

2.2.7 9808 8 CHANNEL MATRIX INPUT CARD. SLOTS 1 TO 10.

The standard configuration of the DIRECTOR 9800 may include up to ten 9808 input cards. Each card has 8 balanced line inputs for a total of 80 inputs per mainframe.
Refer to Section 7.2.2 for the pinout of this connector.

INPUT CARD 1
Channel 1: INPUT 1
Channel 2: INPUT 2
Channel 3: INPUT 3
Channel 4: INPUT 4
Channel 5: INPUT 5
Channel 6: INPUT 6
Channel 7: INPUT 7
Channel 8: INPUT 8

CARD 2	INPUTS 9 to 16
CARD 3	INPUTS 17 to 24
CARD 4	INPUTS 25 to 32
CARD 5	INPUTS 33 to 40
CARD 6	INPUTS 41 to 48
CARD 7	INPUTS 49 to 56
CARD 8	INPUTS 57 to 64
CARD 9	INPUTS 65 to 72
CARD 10	INPUTS 73 to 80

2.2.8 9814 DOWNMIX / SOLO INPUT CARD. SLOT 15. OPTIONAL.

The 9814 card is the output for the downmix and the input for the stereo solo.
Refer to Section 7.2.2 for the pinout of this connector.

INPUT	Channel 1: LEFT, L	(LCRS DOWNMIX)
	Channel 2: RIGHT, R	"
	Channel 3: CENTER, C	"
	Channel 4: SURROUND, S	"
	Channel 5: LEFT ONLY, Lo	(STEREO DOWNMIX)
	Channel 6: RIGHT ONLY, Ro	"
	Channel 7: LEFT SOLO INPUT	
	Channel 8: RIGHT SOLO INPUT	

2.2.8.1 9814 LEVELS

The Downmix levels are set by fixed resistors on the printed circuit board. They may be changed if the factory set up is not appropriate.

Table 1

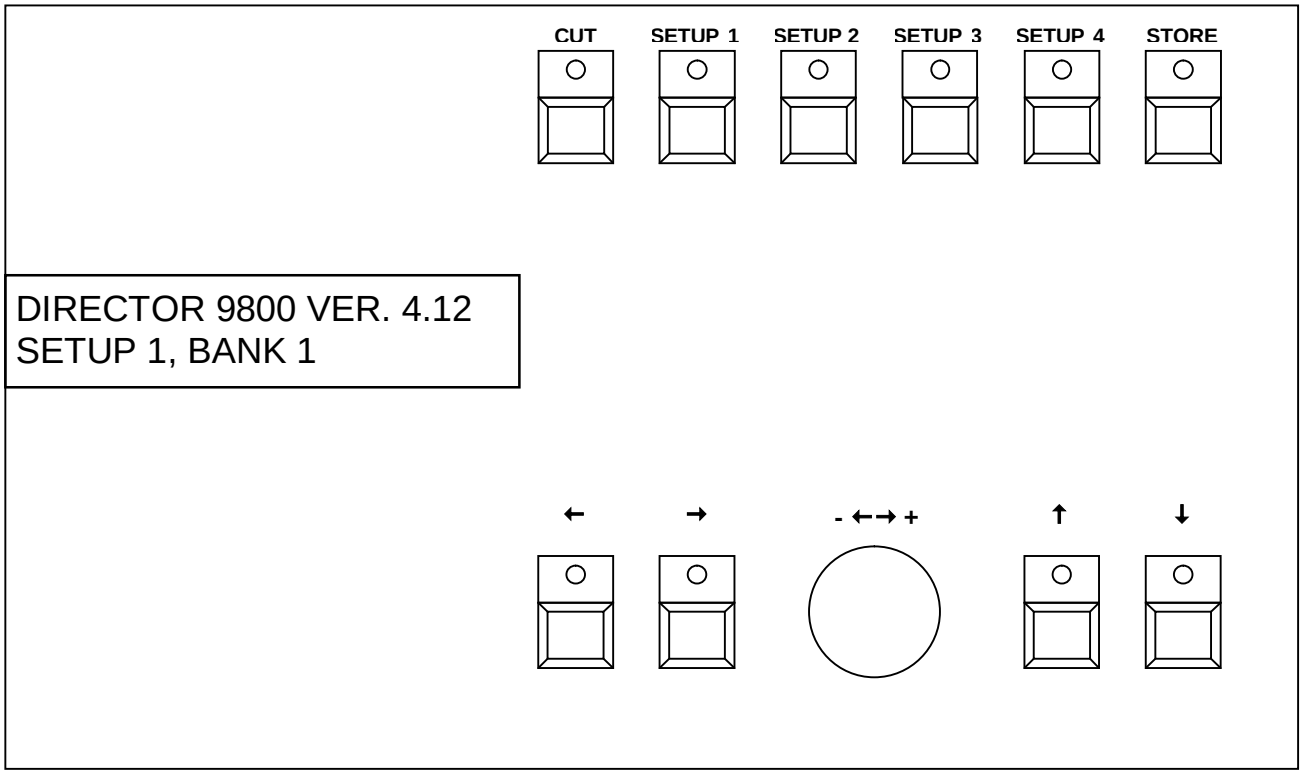
From channel	To L-C-R-S downmix	To Lo-Ro downmix	Resistor	Value	Gain
Left	Left		R1	10 k	0 dB
Right	Right		R3	10 k	0 dB
Center	Center		R5	10 k	0 dB
Surround Left	Surround		R8	14.3 k	-3 dB
Surround Right	Surround		R10	14.3 k	-3 dB
LFE	Center		R12	10 k	0 dB
Mid Left	Left		R15	16.5 k	-4.5 dB
Mid Left	Center		R16	16.5 k	-4.5 dB
Mid Right	Right		R18	16.5 k	-4.5 dB
Mid Right	Center		R19	16.5 k	-4.5 dB
Left		Left only	R2	10 k	-3 dB
Right		Right only	R4	10 k	-3 dB
Center		Left only	R6	16.5 k	-4.5 dB
Center		Right only	R7	16.5 k	-4.5 dB
Surround Left		Left only	R9	10 k	-3 dB
Surround Right		Right only	R11	10 k	-3 dB
LFE		Left only	R13	16.5 k	-6 dB
LFE		Right only	R14	16.5 k	-6 dB
Mid Left		Left only	R17	10 k	-3 dB
Mid Right		Right only	R20	10 k	-3 dB

Note: the overall level of Lo-Ro output as been lowered by 3 dB to avoid clipping.

2.3 FRONT PANEL

The front panel of the DIRECTOR mainframe has a two-line, 20 character Liquid Crystal Display (LCD). It also has switches for CUT, 4 Presets, STORE, LEFT, RIGHT, UP, DOWN and a ROTARY ENCODER.

Figure 2 – Front Panel



CUT	Mutes all outputs to the speaker systems, via a relay that shorts out the line.
SETUP 1	Recalls setup 1 (bank 1), or setup 5 (bank 2), from memory.
SETUP 2	Recalls setup 2 (bank 1), or setup 6 (bank 2), from memory.
SETUP 3	Recalls setup 3 (bank 1), or setup 7 (bank 2), from memory.
SETUP 4	Recalls setup 4 (bank 1), or setup 8 (bank 2), from memory.
STORE	Saves any changes made to the pre-selected SETUP. Once a change has been made in any of the menus, the STORE LED will flash to indicate that the function has become active. If, at any moment you decide not to keep your changes, just press one of the four SETUP buttons to reload from that memory.
←	Shifts the menu to the next item to the left.
→	Shifts the menu to the next item to the right.
-←→+	Allows you to change the value that is shown on the LCD.
↑	Returns you to the main menu level.
↓	Sends you to the sub level menu.

3 MENU SYSTEM (RELEASE 4.XX)

The LCD displays all user information available on the DIRECTOR system. Use the four arrow keys to navigate into the different menus or sub-menus. The ROTARY ENCODER allows you to change the value shown on the display.

In this document, we will refer to these functions with symbols as well as text.

Note: Some functions can be programmed from the remote control as well as from the front panel. They are identified by REM *.*

Here is a list of the symbols for each function:

✂ CUT
S1 SETUP 1
S2 SETUP 2
S3 SETUP 3
S4 SETUP 4
STORE
➔ RIGHT ARROW
➔ LEFT ARROW
UP ARROW
DOWN ARROW
ROTARY ENCODER

3.1 SET UP SELECT MENU REM

The DIRECTOR has eight presets.
Use this menu to select one of two banks, of four presets each, with the ROTARY ENCODER.
Bank 1: memory preset 1-2-3-4.
Bank 2: memory preset 5-6-7-8.

3.1.1 PROCEDURE

- Turn the ROTARY ENCODER to the desired bank
- Press STORE to keep this setting.

Note: After selecting the appropriate bank, you can step through the different memory presets using the four setup keys on the front panel.

3.2 MATRIX INPUT BUSS ASSIGNMENT MENU REM

Use this menu to assign the inputs from the 9808 cards to a specific output buss. One input can only be assigned to one buss at a time.

3.2.1 PROCEDURE

✹ Turn the ROTARY ENCODER to the appropriate input (1 to 80).
🡻 press the DOWN ARROW key to go to the sub menu.
✹ Turn the ROTARY ENCODER to the appropriate BUSS selection (LEFT, RIGHT, CENTER, SURLEFT, SURRIGHT, SUB, MIDLEFT, MIDRIGHT).
🖬 Press STORE to keep this setting.
🡹 Use the UP ARROW to select the main input menu.
✹ Turn the ROTARY ENCODER to the appropriate input.
🡻 Press the DOWN ARROW key to go to the sub menu.
✹ Turn the ROTARY ENCODER to the appropriate BUSS selection. Press STORE to keep this setting.

Repeat this procedure for all inputs.

Note: The system shows you the card number on the menu (9808 # 2).

The input number corresponds to the cards that are configured in your system.

EXAMPLE:
Input 1 to 8 = Card 1 input 1 to 8.
Input 9 to16 = Card 2 input 1 to 8.
Input 17 to 24 = Card 3 input 1 to 8.
Input 25 to 32 = Card 4 input 1 to 8.
Input 33 to 40 = Card 5 input 1 to 8.
Input 41 to 48 = Card 6 input 1 to 8.
Input 49 to 54 = Card 7 input 1 to 8.
Input 55 to 64 = Card 8 input 1 to 8.
Input 65 to 72 = Card 9 input 1 to 8.
Input 73 to 80 = Card 10 input 1 to 8.

3.3 SOURCE MENU REM

Use this menu to assign one or more inputs to a SOURCE button on the remote.
A SOURCE is a group of inputs that are selected together when a source key is selected on the remote control. The corresponding LED for that source will be lit. The SOURCE may have any number of inputs assigned to it, up to the total number of inputs in the system (80 max.).

The input LED on the left side of the 9840 remote will indicate which inputs are selected at any time.

3.3.1 PROCEDURE

✹ Turn the ROTARY ENCODER to the appropriate SOURCE.
(SOURCE = 01 to 32 plus WILD)
🡻 press the DOWN ARROW key to go to the sub menu.
CLEAR ALL INPUTS = NO
✹ Turn the ROTARY ENCODER to yes.
(ONLY IF YOU WANT TO CLEAR ALL INPUTS SELECTED BY THAT SOURCE)
🖬 Press STORE to clear the inputs.
➔ Use the RIGHT ARROW to select the INPUT SELECTION MENU (IN XX = OFF, ON).
✹ Turn the ROTARY ENCODER to the appropriate input. (IN = XX)
🖬 Press STORE to toggle the inputs to ON or OFF.
✹ Turn the ROTARY ENCODER to the next input to be selected or deselected.(IN = XX)
🖬 Press STORE to toggle the inputs to ON or OFF.

Repeat this procedure for all inputs that are selected by that source.

🡅 Press the UP ARROW key to go to the main menu.
✹ Turn the ROTARY ENCODER to the appropriate source.

Repeat the whole procedure for all 32 sources plus the WILD.

3.3.1.1 SOURCE ASSIGNMENT MENU EXAMPLE

A SOURCE is a group of inputs that work together, for example the 6 channels of the mixing desk in a 5.1 configuration. A source can select up to 80 inputs.

EXAMPLE: you have three 9808 input cards and you would like to have four 5.1 sources. The assignment could look like this:

SOURCE 01

	BUSS ASSIGNMENT	**SOURCE ASSIGNMENT**
9808 card 01- CH1 :	INPUT 01 **=** LEFT	INPUT 01 = ON
9808 card 01- CH2 :	INPUT 02 **=** RIGHT	INPUT 02 = ON
9808 card 01- CH3 :	INPUT 03 **=** CENTER	INPUT 03 = ON
9808 card 01- CH4 :	INPUT 04 **=** SUR LEFT	INPUT 04 = ON
9808 card 01- CH5 :	INPUT 05 **=** SUR RIGHT	INPUT 05 = ON
9808 card 01- CH6 :	INPUT 06 **=** SUB	INPUT 06 = ON

All remaining inputs on SOURCE 01 = OFF

SOURCE 02

	BUSS ASSIGNMENT	**SOURCE ASSIGNMENT**
9808 card 01- CH7 :	INPUT 07 = LEFT	INPUT 07 = ON
9808 card 01- CH8 :	INPUT 08 = RIGHT	INPUT 08 = ON
9808 card 02- CH1 :	INPUT 09 = CENTER	INPUT 09 = ON
9808 card 02- CH2 :	INPUT 10 = SUR LEFT	INPUT 10 = ON
9808 card 02- CH3 :	INPUT 11 = SUR RIGHT	INPUT 11 = ON
9808 card 02- CH4 :	INPUT 12 = SUB	INPUT 12 = ON

All remaining inputs on SOURCE 02 = OFF

SOURCE 03

	BUSS ASSIGNMENT	**SOURCE ASSIGNMENT**
9808 card 02- CH5 :	INPUT 13 = LEFT	INPUT 13 = ON
9808 card 02- CH6 :	INPUT 14 = RIGHT	INPUT 14 = ON
9808 card 02- CH7 :	INPUT 15 = CENTER	INPUT 15 = ON
9808 card 02- CH8 :	INPUT 16 = SUR LEFT	INPUT 16 = ON
9808 card 03- CH1 :	INPUT 17 = SUR RIGHT	INPUT 17 = ON
9808 card 03- CH2 :	INPUT 18 = SUB	INPUT 18 = ON

All remaining inputs on SOURCE 03 = OFF

SOURCE 04

	BUSS ASSIGNMENT	**SOURCE ASSIGNMENT**
9808 card 03- CH3 :	INPUT 19 = LEFT	INPUT 19 = ON
9808 card 03- CH4 :	INPUT 20 = RIGHT	INPUT 20 = ON
9808 card 03- CH5 :	INPUT 21 = CENTER	INPUT 21 = ON
9808 card 03- CH6 :	INPUT 22 = SUR LEFT	INPUT 22 = ON
9808 card 03- CH7 :	INPUT 23 = SUR RIGHT	INPUT 23 = ON
9808 card 03- CH8 :	INPUT 24 = SUB	INPUT 24 = ON

All remaining inputs on SOURCE 04 = OFF

Selecting **SOURCE 1** on the remote would enable the first 6 channels of CARD 01 and send the audio signals to their respective speaker outputs.

Selecting **SOURCE 2** on the remote would enable the last 2 channels of CARD 01 and the first 4 channels of CARD 02 and send the audio signals to their respective speaker outputs.

Selecting **SOURCE 3** on the remote would enable the last 4 channels of CARD 02 and the first 2 channels of CARD 03 and send the audio signals to their respective speaker outputs.

Selecting **SOURCE 4** on the remote would enable the last 6 channels of CARD 03 and send the audio signals to their respective speaker outputs.

3.4 DIM DEFAULT 18.0 DB

Programmable DIM, adjustable from 0.000 dB to Mute in increments of .375 dB.

3.4.1 PROCEDURE

- Turn the ROTARY ENCODER to the appropriate dim value. (DIM = - 18.000 dB)
- Press STORE to keep the value in memory.

3.5 SPLA DEFAULT -6.000 DB

Programmable SPLA adjustable from 0.000 dB to Mute in increments of .375 dB.

Note: The level control works as an attenuator with taps every 0.375dB.
SPLA is a programmed tap on the ladder.

3.5.1 PROCEDURE

- Turn the ROTARY ENCODER to the appropriate value. (SPLA = -6.000 dB)
- Press STORE to keep the reference in memory.

3.6 SPLB DEFAULT -12.000 DB

Programmable SPLB adjustable from 0.000 dB to Mute in increments of .375 dB.

Note: Like SPLA, SPLB is a tap on the ladder.

3.6.1 PROCEDURE

- Turn the ROTARY ENCODER to the appropriate value. (SPLB = -12.000 dB)
- Press STORE to keep the reference in memory.

3.7 SPLA REFERENCE DEFAULT : 85

Once you have adjusted your DIRECTOR to a certain SPL level for SPLA, you can display that level on the 9840 Remote control by selecting it in this menu.

Note: This display is an indication only. It is not a measure of the actual level in the studio.

3.7.1 PROCEDURE

- Turn the ROTARY ENCODER to the appropriate reference. (SPLA REF = 60 to 140 dB)
- Press STORE to keep the reference in memory.

3.8 MONO INPUT REM

Selects which busses that are sent to the mono summing amplifier.

3.8.1 PROCEDURE

- Press the DOWN ARROW key to go to the sub menu. (LEFT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the left channel in the mono sum, NO disables it).
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the next buss to be sent to the mono sum. (RIGHT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the right channel in the mono sum, NO disables it.)
- Press STORE to keep the new setting.

Repeat this procedure for all the busses.

- Press the UP ARROW key to go to the main menu.

3.9 MONO OUT REM

Selects how the mono sum will be heard. It can be sent to the Left Speaker, the Right Speaker or the Center Speaker.

3.9.1 PROCEDURE

- Press the DOWN ARROW key to go to the sub menu. (CENTER = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the mono sum to the center speaker, NO disables it).
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the next output for the mono sum. (LEFT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the mono signal to the left speaker, NO disables it).
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the next output for the mono sum. (RIGHT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the mono signal to the right speaker, NO disables it).
- Press STORE to keep the new setting.

Press the UP ARROW key to go to the main menu.

Note: If the mono sum is sent to L and R, the level will be lowered by 6 dB in each channel to maintain the overall level.

Note: If the mono sum is sent to C, this sum will go to the center speaker if SPKR A (surround) is selected. If SPKR B or C (stereo) is selected, the mono sum will go to L-R regardless of the mono out selection.

3.10 EXTSOLO1 OUT

Selects how the stereo solo signal will be heard when EXTSOLO1 GPI is activated.

Note: The solo is a stereo signal. However, it can be summed to mono and assigned to the center speaker if you desire.

3.10.1 PROCEDURE

- Press the DOWN ARROW key to go to the sub menu. (LEFT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the left solo signal to the left speaker, NO disables it).
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the next output for the solo signal. (RIGHT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the right solo signal to the right speaker, NO disables it).
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the next output for the mono sum. (L+R>CENTER = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the left and right solo signals to the center speaker, NO disables them).
- Press STORE to keep the new setting.
- Press the UP ARROW key to go to the main menu.

Note: If the mono sum is sent to C, this sum will go to the center speaker if SPKR A (surround) is selected. If SPKR B or C (stereo) is selected, the mono sum will go to L-R regardless of the mono out selection.

3.11 EXTSOLO1 CONTROL

Enables or disables activation of the solo input mode by an external control. Refer to the GPI section for more information on the external GPI configuration.

3.11.1 PROCEDURE

- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the external solo1 control signal to be active, NO disables it).
- Press STORE to keep the new setting.

3.12 EXTSOLO2 OUT

Selects how the stereo solo signal will be heard when EXTSOLO2 GPI is activated.

3.12.1 PROCEDURE

- Press the DOWN ARROW key to go to the sub menu. (LEFT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the left solo signal to the left speaker, NO disables it).
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the next output for the solo signal. (RIGHT = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the right solo signal to the right speaker, NO disables it).
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the next output for the mono sum. (L+R>CENTER = NO)
- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the left and right solo signals to the center speaker, NO disables them).
- Press STORE to keep the new setting.
- Press the UP ARROW key to go to the main menu.

Note: If the mono sum is sent to C, this sum will go to the center speaker if SPKR A (surround) is selected. If SPKR B or C (stereo) is selected, the mono sum will go to L-R regardless of the mono out selection.

3.13 EXTSOLO2 CONTROL

Enables or disables activation of the solo input mode by an external control. Refer to the GPI section for more information on the external GPI configuration.

3.13.1 PROCEDURE

- Turn the ROTARY ENCODER to YES or NO.
  (YES enables the external solo1 control signal to be active, NO disables it).
- Press STORE to keep the new setting.

Note: EXTSOLO2 control and output assign are an exact duplicate of the EXTSOLO1. It provides a second control to be used in the case of a dual console operation, allowing separate solo functions. EXTSOLO2 shares the audio input signals with EXTSOLO1, only the controls are different.

3.14 CHANNEL ENABLE

Sets the channel enable buttons on the remote to a SOLO or a MUTE type action. If SOLO mode is active, depressing one of the channel enable keys will mute all channels except the one selected. If MUTE mode is selected, depressing one of the channel enable keys on the remote will mute that particular channel only.

3.14.1 PROCEDURE

- Turn the ROTARY ENCODER to SOLO or MUTE. (MODE = XXXX)
- Press STORE to keep the new setting.

3.15 GROUP MODE

If the GROUP MODE is enabled, you have access the “soft grouping” from the source keys on the remote. When you are not in GROUP MODE, the source keys will toggle ON and OFF when activated. The GROUP MODE only applies to the source keys; PEC, DIR and WILD will retain their respective operating modes.

3.15.1 PROCEDURE

- Turn the ROTARY ENCODER to yes or no.

(YES enables the group mode, NO disables it).

- Press STORE to keep the new setting.

3.16 WILD GROUP MODE

If the wild group is enabled, the WILD key on the remote can be used as a group master, just like PEC or DIR. When the wild group is disabled, the WILD key is used as a normal source that can be **toggled** on and off from the regular source selection. Refer to Section 6.3 for how to use the WILD key.

3.16.1 PROCEDURE

- Turn the ROTARY ENCODER to yes or no. (YES enables the wild group, NO disable it).
- Press STORE to keep the new setting.

3.17 GROUP ASSIGNMENT (WILD, PEC, DIR) REM

Sources can be grouped together and the resulting group can be selected using one of the GROUP keys (PEC, DIR, WILD).

3.17.1 PROCEDURE

- Turn the ROTARY ENCODER to the appropriate source. (01 to 32)
- Press the DOWN ARROW key to go to the sub menu. (WILD = ON, OFF)
- Turn the ROTARY ENCODER to ON or OFF.
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the PEC group. (PEC = ON, OFF)
- Turn the ROTARY ENCODER to ON or OFF.
- Press STORE to keep the new setting.
- Use the RIGHT ARROW to select the DIR group. (DIR = ON, OFF)
- Turn the ROTARY ENCODER to ON or OFF.
- Press STORE to keep the new setting.
- Press the UP ARROW key to go to the main menu.
- Turn the ROTARY ENCODER to the next source.

Repeat this procedure for all sources that need to be assigned to a group.

3.18 SPKRA GPI

Enables or disables the corresponding GPI output. If enabled, depressing the SPKRA key on the remote will send a pulse to the SPKRA GPI; depressing SPKRB or SPKRC will send a pulse on SPKRB-C GPI. This can be used to switch an external matrix (i.e. DOLBY SDU4™, from LCRS to stereo and back) automatically when switching from a multi-channel speaker system to a stereo speaker system.

3.18.1 PROCEDURE

- Turn the ROTARY ENCODER to yes or no. (YES enables the GPI, NO disables it).
- Press STORE to keep the new setting.

3.19 CUE GPI

Sets the mode of the GPI output to a momentary or a toggle type of action. The CUE LED on the remote shows the state of the CUE GPI.

3.19.1 PROCEDURE

- Turn the ROTARY ENCODER to MOMENT or TOGGLE.
- Press STORE to keep the new setting.

Note: The CUE has no action on the DIRECTOR. It is just a GPI.

3.20 SETUP COPY MENU

Use this menu to copy a memory setup to any other memory setup (other than itself).

3.20.1 PROCEDURE

- Press the down arrow key to go to the sub menu. (FROM SETUP 1)
- Turn the ROTARY ENCODER to the appropriate source memory setup.
- Use the RIGHT ARROW to select the destination submenu. (TO SETUP 2)
- Turn the ROTARY ENCODER to the appropriate destination memory.
- Use the RIGHT ARROW to select the confirm submenu.
- Turn the ROTARY ENCODER to confirm. (YES, NO)
- Press **STORE** to keep the new setting and initiate the copy.

Wait until the memory is copied.

Repeat this procedure if necessary.

4 9840 REMOTE CONTROL

4.1 OVERVIEW

The 9840 remote control is the operator's interface. It has all necessary controls and indicators normally required in the course of a session.

The left-hand side has LED indicators, showing which inputs are in use. This is particularly useful when many inputs or combinations of sources are selected.

At the bottom left, there is a 4 digit alphanumeric display, giving relevant information according to the mode the remote control is in. It normally displays the monitoring level, as set by SPLA REF and the position of the tap on the attenuator ladder. In a programming mode, it will prompt you as to what is being programmed.

The top two rows of switches are the SOURCE select switches. In combination with the SHIFT key, these switches give access to the 32 sources.

The switches on the third row are the CHANNEL ENABLE keys. These can be either MUTE or SOLO for the individual speaker channels.

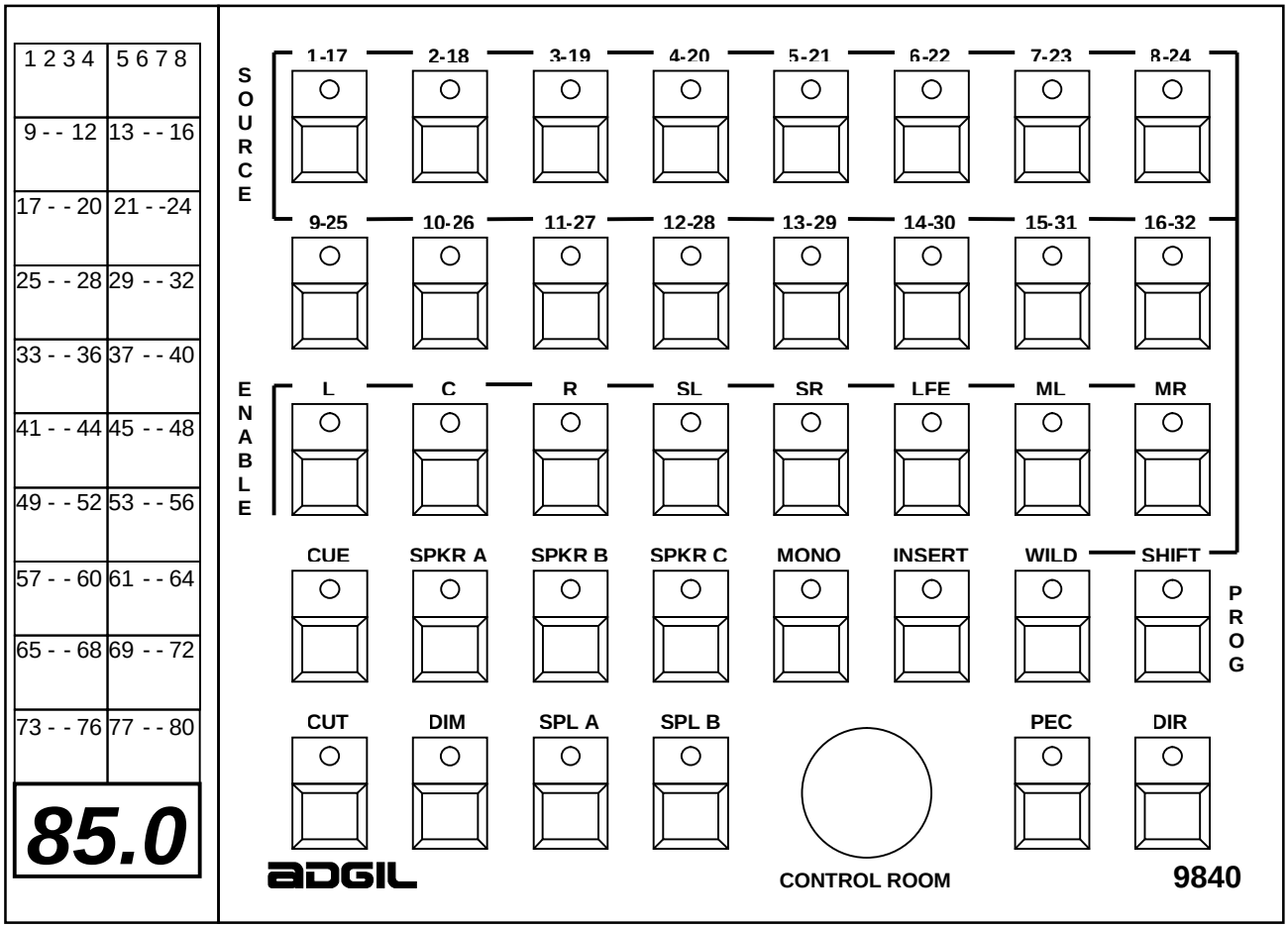
The fourth row has various functions, such as CUE, SPEAKER SYSTEM SELECT, MONO, INSERT, WILD group and SHIFT.

The switches on the left-hand side of the bottom row deal with listening levels, including CUT, DIM, SPLA and SPLB.

Next to them is a rotary shaft encoder that serves a number of functions on the DIRECTOR. This ROTARY ENCODER is normally the variable volume control for the speakers, but it becomes a selector in programming mode.

The switches on the right of the ROTARY ENCODER control the PEC and DIR groups.

Figure 3 – Remote Control



5 9840 REMOTE CONTROL PROGRAMMABLE FUNCTIONS

The 9840 remote control gives you access to the programming features of the DIRECTOR that are used during a session.

Note: While programming the MONO mix or the sources, the DIRECTOR will remain active for some of the functions like CUE, SPKRA, SPKRB, SPKRC, SPLA, SPLB and INSERT so you can continue monitoring while programming.

5.1 SOURCE AND BUSS ASSIGN

This function enables you to assign any number of INPUTS to a SOURCE and lets you change the BUSS assignment of an INPUT.

5.1.1 PROCEDURE

- Select a SOURCE by pressing on any of the 32 source keys or the WILD key.
- While keeping that SOURCE key depressed, toggle the SHIFT key once.
- Release the SOURCE key and the SHIFT key.
- The SHIFT key LED will be flashing, indicating programming mode. The SOURCE key LED will be flashing, indicating which source is being programmed.
- The alpha-numeric display shows “IN 01” and input 1 on the 80 LED column is flashing.
- If any of the 80 inputs is associated with that SOURCE it will be shown on the 80 LED column.
- The assignment of INPUT 01 is shown on the 8 LEDs of the ENABLE switches.
- A flashing LED means that the INPUT is not associated with the selected SOURCE, but is assigned to that BUS.
- A LED that is on means that the INPUT is associated with this SOURCE and assigned to that BUS.
- To toggle the status of this INPUT, press on the ENABLE key that is lit (deselects the input from the source), or flashing (selects the input into that source and keeping the input assignement), or unlit (selects the input into the source and changing the input assignement).

IMPORTANT NOTE:
You can change the BUSS assignment by selecting a different ENABLE key than the one that is active (flashing or on), but remember that each input can only be assigned to one BUSS at a time. If you change the BUSS assignment of an input, it will be changed for all the SOURCES that use this input.

- Use the ROTARY ENCODER to select another input and repeat the operation for all the inputs that you want assigned to that SOURCE.
- To end the source programming mode press any of the SOURCE keys or the SHIFT key.

5.2 MONO INPUT AND OUTPUT ASSIGN

This function enables you to assign any of the 8 BUSSES to the MONO mix and lets you redirect the output of the MONO signal to the left, right or center speaker.

5.2.1 PROCEDURE

- Press and hold the MONO key.
- Toggle the SHIFT key once.
- Release the MONO key and the shift key.

The SHIFT key LED will be flashing, indicating programming mode. The MONO key LED will be flashing, indicating that mono is being programmed.

- The display shows “M in” (Mono buss inputs).
- The 8 LEDs of the ENABLE switches will be on or flashing.
- A flashing LED means that the BUSS is not being sent to the MONO mix.
- A solidly lit LED means that the BUSS is being sent to the MONO mix.
- To toggle the status of the BUSS assignment to the MONO mix, press on the ENABLE key that is on or flashing.
- Turn the ROTARY ENCODER to the right to select the MONO output.
- The display shows “M out” (Mono output).
- To toggle the status of the output assignement of the MONO mix, press on the ENABLE key that is lit or flashing.
- To end the source-programming mode, select any of the SOURCE keys, the SHIFT key or the MONO key.

Note: The Mono mix can be assigned to SPKR L, R or C in a multi speaker setup. If speaker B or C is selected, the Mono mix will always go to L + R regardless of the output assignment.

5.3 MEMORY SETUP SELECTION

This function lets you select eight different memory setups (1 to 8).

5.3.1 PROCEDURE

- Press and hold the CUT key.
- Toggle the SHIFT key once.
- Release the CUT key and the SHIFT key.
- Only the SHIFT key LED will be flashing.
- The display shows “SETx” (x = 1 to 8).
- Turn the ROTARY ENCODER to the new memory setup (1 to 8) that is to be selected.
- The only key that will save the new setup selection is the SHIFT KEY.
- ANY OTHER KEY WILL RELEASE YOU FROM THE MEMORY SETUP MENU WITHOUT CHANGES.

Note: This function is the same as the one found on the front panel (SETUP 1 through 4 and bank selection).

5.4 PEC

PEC is the select key for the PEC GROUP.

5.4.1 PROCEDURE

- Press and hold the PEC key.
- Toggle the SHIFT key once.
- The PEC key LED is flashing, as well as the SHIFT key LED.
- Release both the PEC and the SHIFT keys.
- Select the SOURCES that are to be part of the PEC group using the SOURCE keys. Press again to deselect.
- Once a SOURCE has been selected, its LED will remain ON indicating that it is is part of the group.
- Press the PEC key to exit the programming mode.

5.5 DIR

DIR is the select key for the DIR GROUP.

5.5.1 PROCEDURE

- Press and hold the DIR key.
- Toggle the SHIFT key once.
- The DIR key LED is flashing, as well as the SHIFT key LED.
- Release both the DIR and the SHIFT keys.
- Select the SOURCES that are to be part of the DIR group using the SOURCE keys. Press again to deselect.
- Once a SOURCE has been selected, its LED will remain ON indicating that it is is part of the group.
- Press the DIR key to exit the programming mode.

5.6 WILD

Depending on the WILD GROUP MODE (front panel programming), the WILD key can be used to select either a SOURCE which toggles on and off, or a GROUP.

5.6.1 PROCEDURE

If the WILD group mode is on:

- Press and hold the WILD key.
- Toggle the SOURCE keys to select or de-select from the group. The SHIFT key remains active to give access to sources 17 to 32
- Release the WILD key.

Once the WILD key is a group master, depressing on it will select or de-select the group of sources assigned to it. When the group is de-selected only the WILD source will remain active with the input selection that you have made in the source menu (WILD is the last source to be programmed in the menu, after source 32).

6 9840 REMOTE CONTROL FUNCTIONS

6.1 SOURCE KEYS 1 THROUGH 16.

6.1.1 SELECTING A SOURCE

To select a source you have to press the button corresponding to that source. For example, selecting SOURCE1 on the remote would enable the inputs that have been preconfigured in the source menu.

EXAMPLE: Selecting SOURCE1 would enable the first six inputs of card one and send these inputs to the busses that have been selected in the buss assignment menu.

SOURCE 01

	BUSS ASSIGNEMENT	**SOURCE ASSIGNEMENT**
9808 card 01- CH1 :	INPUT 01 = LEFT	INPUT 01 = ON
9808 card 01- CH2 :	INPUT 02 = RIGHT	INPUT 02 = ON
9808 card 01- CH3 :	INPUT 03 = CENTER	INPUT 03 = ON
9808 card 01- CH4 :	INPUT 04 = SUR LEFT	INPUT 04 = ON
9808 card 01- CH5 :	INPUT 05 = SUR RIGHT	INPUT 05 = ON
9808 card 01- CH6 :	INPUT 06 = LFE	INPUT 06 = ON

All remaining INPUTS on SOURCE 01 = OFF

6.1.2 SOFT GROUPING - GROUP MODE ENABLED

To select multiple sources in the soft grouping mode, all you have to do is hold down one of the source keys and press the other sources to select or de-select them. As long as you have one of the source keys selected, you can continue selecting or de-selecting sources.
If you have selected multiple sources, the first source key you selected has become your group master. To select or de-select the whole group, all you have to do is to press that first source key.

6.1.3 GROUP MODE DISABLED

If the GROUP MODE is DISABLED the source key will only toggle that source on and off when depressed, it has no effect on other sources.

WARNING: If you are in GROUP DISABLED mode, the soft grouping selection is disabled.

LED STATUS:
ON: Source is selected
OFF: Source is muted

Note: There is always at least one source selected at any time. Should you want to have no signal in the busses, or insert sends, select a source that has no input assigned to it.

6.2 SHIFT KEY

Selecting the SHIFT key will bring you to the second bank of sources (17 to 32). The same instructions apply to both the shifted bank and the non-shifted bank. (Refer to the source key paragraph for information on how to use the sources).

LED STATUS:
ON: Shift bank is selected (source 17 to 32).
OFF: Shift bank is not selected (source 1 to 16).

Note: There is at least one source selected at any time. When you select the shifted bank for the first time, there will be no source selected in that bank (all source LEDs blank), but the previous source selection is still active. The previous bank selection will be de-activated the moment you select a new source in the shifted bank.

WARNING: You cannot make any source selection if you keep the shift key depressed.

6.3 WILD KEY

The WILD key gives access to two different functions, depending on the selected WILD group mode.

If the WILD group mode is ON, the WILD key will behave like the other group masters (PEC and DIR).

If the WILD group mode is OFF, the WILD key will behave like a SOURCE, but this source will toggle on and off when selected, without any effect on the other sources. The other sources will have no effect on the WILD source either. This function is really useful in ADR, when music, ambiances and sound effects have to be brought in and out without deselecting the dialogs.

LED STATUS:
ON: Wild source is selected
OFF: Wild source is muted

Note: When you assign sources to the WILD key in GROUP MODE the SHIFT key remains active so that you can select both banks of sources.

6.4 ENABLE KEYS

These keys can function as either MUTE or SOLO for the individual speaker channels. The mode selection is programmed from the front panel of the DIRECTOR.

LED STATUS:
ON: Channel is enabled
FLASH: Channel is muted
OFF: Channel is disabled (i.e. There is no input routed to that channel).

Note: Mute turns off only the selected channel, the others are untouched. Solo mutes all other channels, leaving the selected one untouched. It is possible to mute or solo more than one channel at a time.

6.5 SPKRA KEY

Selects the multi-channel speaker system A.

LED STATUS:
ON: Speaker system A is selected.
OFF: Speaker A is not selected.

6.6 SPKRB KEY

Selects the stereo speaker system B.

Note: if you have a dual multi-channel DIRECTOR system, SPKRB will select the second multi-channel speaker system.

LED STATUS:
ON: Speaker system B is selected.
OFF: Speaker system B is not selected.

6.7 SPKRC KEY

Selects the stereo speaker system C.

LED STATUS:
ON: Speaker system C is selected.
OFF: Speaker system C is not selected.

6.8 MONO KEY

Selects or de-selects the software pre-configured mono source and sends it to the software pre-configured speaker output.

LED STATUS:
ON: The MONO function is active
FLASH: The external SOLO signal is active
OFF: The MONO function is inactive

Note: The inputs and outputs are pre-selected in the mono-in and mono-out menu on the front panel of the DIRECTOR

The MONO source has its level stored in memory. This can be modified by turning the ROTARY ENCODER while keeping the MONO key depressed. The level will show on the display from 0.1 to 12.0. This level has approximately 18 dB of range and is not a calibrated level.

6.9 CUE KEY

This key triggers the CUE GPI output. Momentary or toggle action, as selected in the CUE GPI menu on the front panel of the DIRECTOR.

LED STATUS:
ON: The Cue GPI open collector output is active.
OFF: The Cue GPI open collector output is not active.

6.10 INSERT KEY

This key selects the signal sent to speakers and meters.

LED STATUS:
ON: The signal from the 9804 insert return card is selected.
OFF: The signal from the 9803 buss amplifier card is selected.

6.11 CUT KEY

This key mutes all speaker outputs.

LED STATUS:
ON: All speaker systems are muted.
FLASH: All speaker systems are muted by an external cut control signal.
OFF: All selected speaker systems are unmuted.

Note: This is an electronic switch, as opposed to the CUT switch on the front panel of the mainframe that activates a relay on the output of the unit for speaker protection.

6.12 DIM KEY

This key dims all speaker systems by a pre-selected amount. This amount can be adjusted in the DIM menu on the front panel of the DIRECTOR.

LED STATUS:
ON: All speaker systems are dimmed.
FLASH: All speaker systems are dimmed by an external dim control signal.
OFF: All selected speaker systems are not dimmed.

6.13 SPLA KEY

This key sets the output to a pre-selected level. This level can be adjusted in the SPLA menu on the front panel of the DIRECTOR.

LED STATUS:
ON: The level of the system matches the SPLA level.
OFF: The level of the system does not match the SPLA level.

6.14 SPLB KEY

This key sets the output to a pre-selected level. This level can be adjusted in the SPLB menu on the front panel of the DIRECTOR.

LED STATUS:
ON: The level of the system matches the SPLB level.
OFF: The level of the system does not match the SPLB level.

Note: When the SPLA or SPLB levels are attained, the corresponding LED will be active on the remote. If neither of the two LEDS is on, then the system is not at either SPLA or SPLB.

6.15 PEC KEY

This key selects the sources assigned to the PEC group.

LED STATUS:
ON: PEC is selected.
OFF: PEC is not selected.

6.16 DIR KEY

This key selects the sources assigned to the DIR group.

LED STATUS:
ON: DIR is selected.
OFF: DIR is not selected.

6.17 INPUT LEDS

The 80 LED display on the left side of the 9840 remote will reflect the status of the inputs. If an input is selected, the corresponding led will be lit.

6.18 FINE OR COARSE VOLUME CONTROL MODE

To toggle the volume control mode (fine = 0.375 db/step or coarse = 4.5 db/step) press on the speaker switch that is already selected.

Example: SPKRA is selected, depressing the SPKRA switch once will select the coarse adjustment and depressing it once again will select the fine adjustment. If you switch between speaker systems, the DIRECTOR will retain the last volume mode that was selected.

7 INSTALLATION

7.1 CONNECTING TO THE DIRECTOR

Connect your console or sound source outputs to the 9808 Matrix Input cards of the DIRECTOR.
Connect the 9805C Master and Slave output cards cards to your power amplifiers.
If you have any equipment that normally functions as an insert, connect it to the 9803A Insert Send card and the 9804A Insert Return card to the output of that equipment.
Connect the 9840 Remote Control to the 9806 Interface card using the provided cable.

7.2 CONNECTORS

All connectors on the cards are type DB25. Female connectors are used for the audio inputs and male connectors for the outputs. These connectors follow the standard pinout configuration used for the TASCAM DA88™ series.

The 9806 interface card is NOT used for audio interconnection and does not follow this convention.

The connector on the remote control is a type DB9, male.

7.2.1 CONNECTORS FOR I/O CARDS 9803A,9803A-MET, 9804A, 9805C-M, 9805C-S, 9808, 9814

7.2.1.1 PINOUT OF THE DB25 AUDIO CONNECTORS

1 - CHANNEL 8 HOT
2 - SHIELD
3 - CHANNEL 7 COLD
4 - CHANNEL 6 HOT
5 - SHIELD
6 - CHANNEL 5 COLD
7 - CHANNEL 4 HOT
8 - SHIELD
9 - CHANNEL 3 COLD
10 - CHANNEL 2 HOT
11 - SHIELD
12 - CHANNEL 1 COLD
13 - SHIELD
14 - CHANNEL 8 COLD
15 - CHANNEL 7 HOT
16 - SHIELD
17 - CHANNEL 6 COLD
18 - CHANNEL 5 HOT
19 - SHIELD
20 - CHANNEL 4 COLD
21 - CHANNEL 3 HOT
22 - SHIELD
23 - CHANNEL 2 COLD
24 - CHANNEL 1 HOT
25 - SHIELD

Note: The shields are all internally connected to the chassis via the panel on each card.

7.2.1.2 Audio connections

L	Left Front.
R	Right Front.
C	Center Front.
SL	Surround Left.
SR	Surround Right.
LFE	Low Frequency Effects.
ML	Mid Left, either Inner Left in a 7.1 system or Surround Back Left in a 5.1 EX system.
MR	Mid Right, either Inner Right in a 7.1 system or Surround Back Right in a 5.1 EX system.
S	Surround, Surround output of the LCRS downmix.
Lo	Left only, Left output of the stereo downmix.
Ro	Right only, Right output of the stereo downmix.

Card	DB25	In/Out	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8
9803A	male	Out	L	R	C	SL	SR	LFE	ML	MR
9803A-MET	male	Out	L	R	C	SL	SR	LFE	ML	MR
9804	female	In	L	R	C	SL	SR	LFE	ML	MR
9805-M	male	Out	A-L	A-R	A-C	A-SL	B-L	B-R	C-L	C-R
9805-S	male	Out	A-SR	A-LFE	A-ML	A-MR	-	-	-	-
9808	female	In	1	2	3	4	5	6	7	8
9814	male	Out/In	L Out	R Out	C Out	S Out	Lo Out	Ro Out	Solo L In	Solo R In

7.2.2 CONNECTOR FOR 9806C INTERFACE CARD

The 9806C is a microprocessor control card that provides an interface between the outside world (GPI connections), the remote control, the front panel and all the audio cards in the chassis.

7.2.2.1 PINOUT OF FEMALE DB25

1 - DIGITAL GND
2 - DIGITAL GND
3 - RS422 RECEIVE -
4 - RS422 TRANSMIT -
5 - REMOTE ENABLE INPUT
6 - +10 VOLT FUSED AT 250ma.
7 - DIR LED OUTPUT
8 - DIR PADDLE SWITCH INPUT
9 - SPKRA GPI OUTPUT
10 - TALK GPI OUTPUT
11 - EXT SOLO1 CTRL INPUT
12 - EXT DIM CTRL INPUT
13 - DIGITAL GND
14 - +10 VOLT (Current limited 270 ma.)
15 - +10 VOLT (Current limited 270 ma.)
16 - RS422 RECEIVE +
17 - RS422 TRANSMIT +
18 - NOT CONNECTED
19 - NOT CONNECTED
20 - PEC LED OUTPUT
21 - PEC PADDLE SWITCH INPUT
22 - SPKRBC GPI OUTPUT
23 - CUE GPI OUTPUT
24 - EXT CUT CTRL INPUT
25 - EXT SOLO2 CTRL INPUT
SHELL - CHASSIS GND

Pins 1 to 6 and 14 to 17 are used to connect to the 9840 Remote Control, via a provided 50' cable (Canare A2C3).

The other pins can be used to connect to external commands and indicators.

Note: RS422 Transmit and Receive signal are those from the 9806C Card point of view.

7.2.3 CONNECTOR FOR THE REMOTE CONTROL

7.2.3.1 PINOUT OF MALE DB9

1 - DIGITAL GND
2 - DIGITAL GND
3 - RS422 RECEIVE -
4 - RS422 TRANSMIT
5 - REMOTE ENABLE INPUT
6 - +10 VOLT (Current limited 270 ma.)
7 - +10 VOLT (Current limited 270 ma.)
8 - RS422 RECEIVE +
9 - RS422 TRANSMIT +
SHELL - CHASSIS GND

7.2.4 CONNECTING TO EXTERNAL CONTROLS AND INDICATORS

Pins 6 to 13 and 20 to 25 of the DB25 on the 9806C interface card are used to interface with external commands and indicators in the studio. A +10V, unregulated supply, fused at 250 mA, is available if needed. The reference for all controls and indicators is the DIGITAL GND.

7.2.4.1 Pins 6 to 13

6. +10V. Unregulated supply, fused at 250 mA.

7. DIR LED OUTPUT. TTL level (+5 volt), active high, driven through a 300-ohm resistor to drive a LED directly. The LED is on when the DIR group is active.

8. DIR PADDLE SWITCH INPUT. Logic active-low, diode protected input. A logic low applied to this pin will select the DIR group and de-select all other active groups or sources.

9. SPKRA GPI OUTPUT. Open collector output. Pulse. Provided to switch an external unit requiring switching when the multi-channel speaker system is selected (i.e. DOLBY SURROUND DECODER SDU-4™). See **SPKRBC GPI** to select a stereo setup.

10. Talk GPI Output. Open collector output. This function is not currently implemented.

11. EXT SOLO1 CTRL INPUT. Logic active-low, diode protected input. A logic low applied to this pin will select the stereo solo input instead of the remote selected sources. This control is only active if you have the EXTSOLO1 CTRL enabled in the menu. You must have the 9814 Downmix/Solo-in card installed to be able to route the Solo audio signal to the speaker system. When an external solo control signal is active, the LED on the MONO key will flash on the remote.

12. EXT DIM CTRL INPUT. Logic active-low, diode protected input. A logic low applied to this pin will dim all the speaker systems by the pre-selected dim amount. When an external dim control signal is active, the LED of the DIM key will flash on the remote.

13. DIGITAL GND. The reference for all switches and LEDs. Return for the +10 V.

7.2.4.2 Pins 20 to 25

20. PEC LED OUTPUT. TTL level (+5 volt), active high, driven through a 300-ohm resistor to drive an LED directly. The LED is on when the PEC group is active.

21. PEC PADDLE SWITCH INPUT. Logic active-low, diode protected input. A logic low applied to this pin will select the PEC group and de-select all other active groups or sources.

22. SPKRBC GPI OUTPUT. Open collector output. Pulse. Provided to switch an external unit requiring switching when one of the stereo speaker system (B or C) is selected (i.e. DOLBY SURROUND DECODER SDU-4™). See **SPKRA GPI** to select a multi-channel setup.

23. CUE GPI OUTPUT. Open collector output. It provides an output to interface with an external cue signal (red light, cue light, etc.).

24. EXT CUT CTRL INPUT. Logic active-low, diode protected, input. A logic low applied to this pin will mute all the speaker systems. When an external cut control signal is active, the CUT key LED will flash on the remote.

25. EXT SOLO2 CTRL INPUT. Logic active-low, diode protected input. A logic low applied to this pin will select the stereo solo input instead of the remote selected sources. This control is only active if you have the EXTSOLO2 CTRL enabled in the menu. You must have the 9814 Downmix/Solo-in card installed to be able to route the Solo audio signal to the speaker system. When an external solo control signal is active, the LED on the MONO key will flash on the remote.

8 LEVEL CALIBRATION

The DIRECTOR is designed to handle maximum levels of +28 dBu at any input, +28 dBu at the Insert send and +22 dBu at the speaker output. In order to optimize both headroom and noise performance, it is important to calibrate levels properly.

Notes:

1) *The operating level of all sources should be identical to provide consistent acoustical levels when switching from one source to the other.*

2) *If several sources are selected simultaneously, the combined level will rise, diminishing the headroom at an average rate of 3 dB every time you double the number of sources.*

3) *Most power amplifiers are capable of providing full power (clipping) with audio levels in the range of 0 to +8 dBu (peak levels, not average operating levels).*

4) *The DIRECTOR is built using 1% resistors. The channel-to-channel gain variations are minimal.*

8.1 ELECTRONIC LEVELS

8.1.1 PROCEDURE

Values in brackets [xxx] are the factory default and probably a good starting point for your setup.

1) Turn your amplifiers or speakers off.
2) Decide on the nominal operating level for the studio [0 VU = +4 dBu].
3) Apply this level [Sine wave at 1 kHz] to one input [1].
4) Route this input to a buss [L].
5) Measure the level of that buss at the Insert Send point, with its nominal load attached.
6) Adjust for nominal level [+4 dBu], using the multiturn trimmer at the back of the 9803A card.
7) If your system has a 9803A-MET meter output card, trim the output [L] with its own trimmer.
8) Route the input [1] to another buss [R] and repeat steps 5 to 7 for that buss (and meter).
9) Repeat for every other buss (and meter).
10) Select Speaker A with the remote control and turn the listening level to the maximum, using the ROTARY ENCODER.
11) Apply the test signal [1 kHz, +4 dBu] to one input [1] and route this input to one output [L].
12) On the 9805C-M card (Master Output), adjust A-L trimpot for the desired level [0 dBu] at Speaker A Left Output.
13) Route the Input to R output and adjust A-R (Speaker A Right Output) for the same level as A-L.
14) Repeat steps 11 and 12 for all the outputs (A-C, A-SL, A-SR, A-LFE, A-ML, A-MR, B-L, B-R, C-L, C-R).

8.2 ACOUSTIC LEVELS

You will need a Sound Level Meter (SLM) with C-weighting and a slow reading characteristic to calibrate the system acoustically. In a room designed for critical listening, it is of the utmost importance to know the nominal listening levels. Once the acoustic calibration has been completed, the digital readout on the remote control will display the actual listening levels in the room. (In the following procedure, the values in square brackets [xxx] are examples of the nominal levels used in a film mixing theater.)

Notes:

1) *Only LEVELS may be calibrated with the* DIRECTOR *not EQ.*

2) *The SPL display on the 9840 remote control [85] is just an indication that reflects what the level would be if a Pink Noise, at nominal level [0 VU], was sent to one channel [L].*

8.2.1 PROCEDURE

1) Determine the nominal listening level [85 dBC, slow reading, pink noise in one channel]. This will become SPL-A. (See ITU, ISO-2969 or Dolby recommendations).
2) Determine how much headroom is needed [20 dB].
3) Determine what the alternate listening level should be [79 dBC, slow]. This will become SPL-B.
4) Decide how much extra gain you may want to apply to your listening program material [6 dB], to check for background noise, for example.
5) Go to the menu on the front panel, called SPL-A.
6) Turn the front panel ROTARY ENCODER until the display reads [-6.000] dB (the extra gain above normal listening level, as defined in step 4).
7) Save that level.
8) Go the menu on the front panel, called “SPLA Reference”.
9) Turn the ROTARY ENCODER until the display reads the value for your nominal listening level [85].
10) Save that level.
11) Go to the menu called “SPL-B”.
12) Turn the ROTARY ENCODER until the display reads the alternate listening level [-12.000, 6 dB below SPL-A].
13) Save that level.
14) Select SPL-A on the remote control, remove any MUTE or DIM.
15) Turn the speakers or amplifiers ON with the level control on the amps turned down.
16) Route a pink noise at nominal level [0 VU] to one speaker [L].
17) Turn the gain control up on the power amplifier, or the speaker, until the SLM reads your nominal listening level [85 dBC, slow]. If the power amplifiers do not have a volume control, the trimpots on the 9805C cards may be used, thus changing the calibration in steps 12 to 14 of the electronic calibration procedure.
18) Repeat the previous two steps for the other speakers in the system.
19) Verify that your desired headroom is preserved, including equalization if present.

9 SPECIFICATIONS

For the following specifications, unless otherwise specified, the test signals used were sine wave tones. The reference level is +4 dBu = 1.228 Vrms. Tests were performed using an AUDIO PRECISION PORTABLE ONE™ test set, with one source selected, SPKRA, SPLA = - 6.000 dB, +4 dBu IN = -6 dBu OUT.

9.1 INPUTS

Max input level (any input)	+28 dBu.
Impedance	20 kΩ bal, I0 kΩ to ground per leg.
CMRR (typical)	80 dB @ 100 Hz. 78 dB @ 1 kHz. 60 dB @ 20 kHz.

9.2 OUTPUTS

Max output level	+28 dBu, 10 kΩ load at INSERT SEND. +22 dBu, 10 kΩ load at SPKR output.
Output noise	-96 dBu un-weighted, 22 Hz-22 kHz. -99 dBu A-weighted.
Output bandwidth	-0.2 dB @ 10 Hz, -3 dB @ 70 kHz, ref. 1 kHz.
Output distortion	0.004 % THD+N, from 10 Hz to 30 kHz.
Crosstalk L - R	-110 dB @ 20 Hz. -93 dB @ 1 kHz. -65 dB @ 20 kHz.

9.3 DYNAMIC RANGE, HEADROOM AND NOISE

Keeping adequate headroom, while preserving a low noise floor, may be an interesting exercise.

The following table shows values in a DIRECTOR, measured with an AUDIO PRECISION PORTABLE ONE™.

One Input [1] is routed to one buss [L], with settings at nominal.

Measured at L Out	Signal Level [dBu]	Clipping [dBu]	Headroom [dB]	Noise Floor [dBu, 20Hz-20kHz]	Dynamic Range [dB]
Insert Send	+4.00	+28.0	24.0	-98.0	126
Speaker A Out	-6.00	+22.0	28.0	-97.0	119

9.4 DIMENSIONS

Weight: 7 kg (15 lbs).
Chassis: 19" x 3U: 480 x 133 x 260 mm (19” x 5.25" x 10.25").
Remote control: 210 x 152 x 51 mm (8.25" x 6" x 2")
Supply: 117 V or 230 V AC +/- 15%, 50/60Hz, 25VA average, fused @ 1 Amp S.B.

10 APPENDICES

10.1 A: BLOCK DIAGRAM

10.2 B: BUSS AMP / INSERT SEND

10.3 C: METER FEED

10.4 D: INSERT RETURN / MONO MIX

10.5 E: MASTER OUTPUT

10.6 F: SLAVE OUTPUT

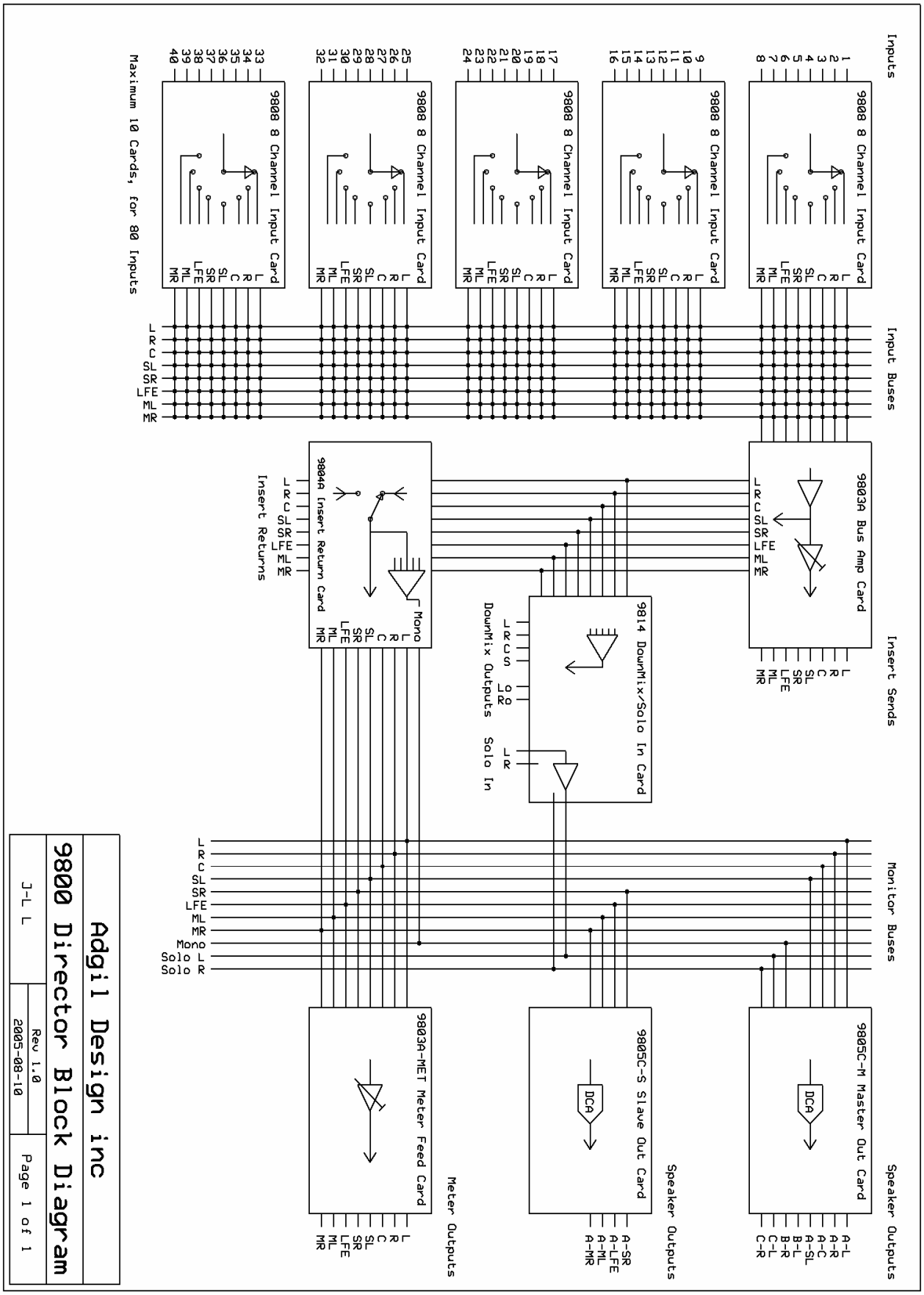
10.7 G: MATRIX INPUT

10.8 H: DOWNMIX / SOLO IN

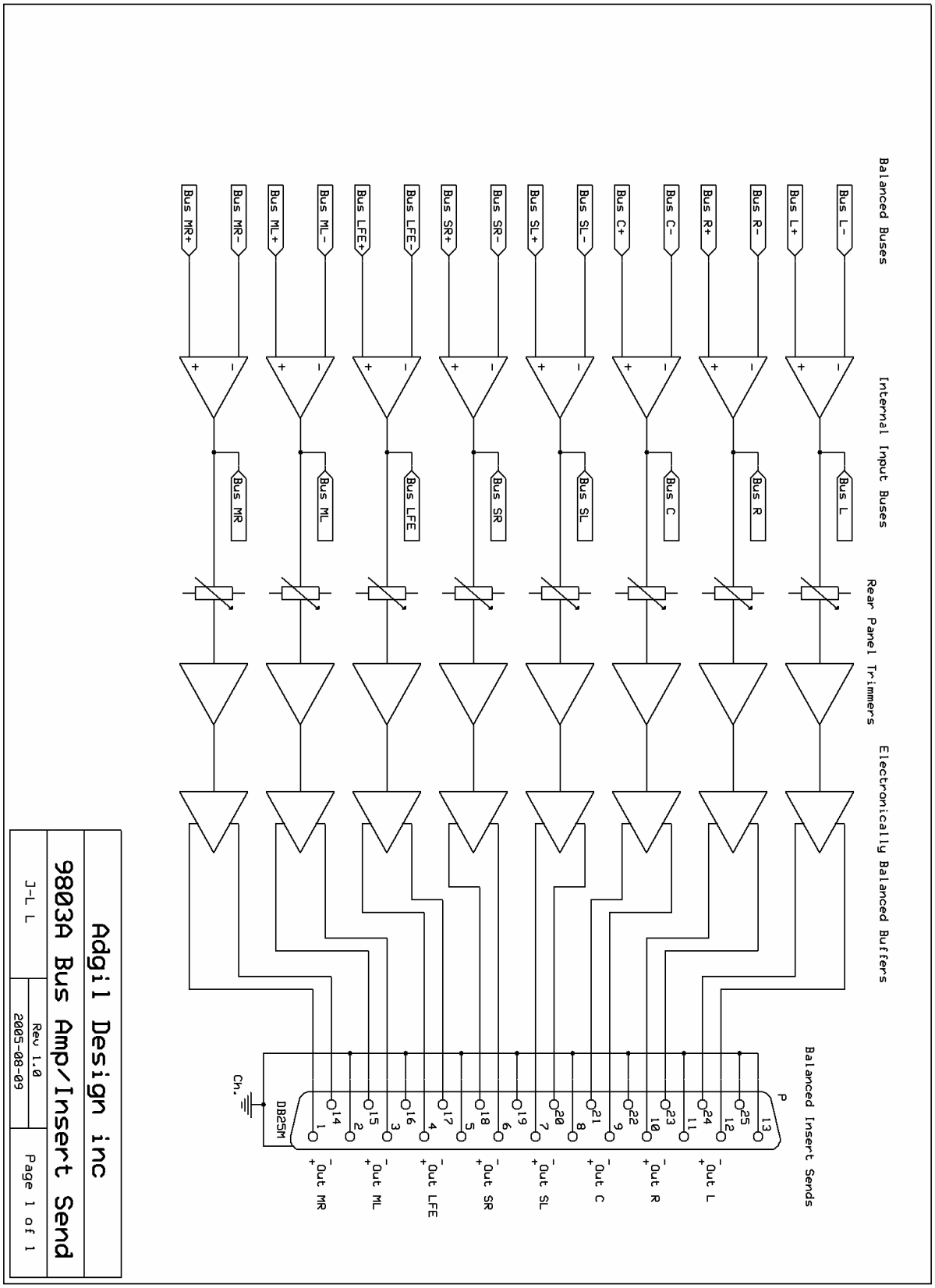
10.9 I: STUDIO INTEGRATION EXAMPLE

10.10 J: CONFIGURATION AS SHIPPED

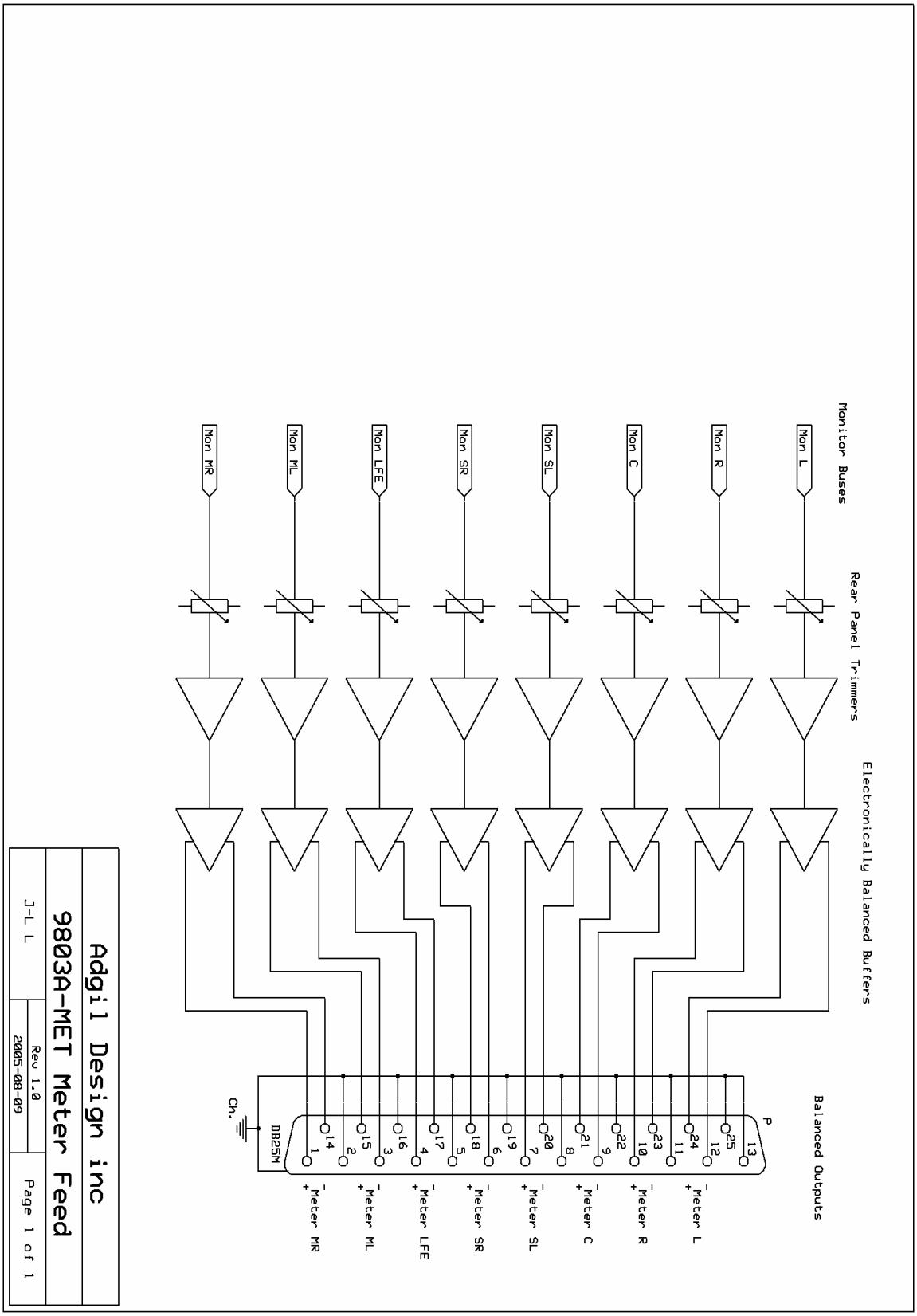
APPENDIX A – BLOCK DIAGRAM



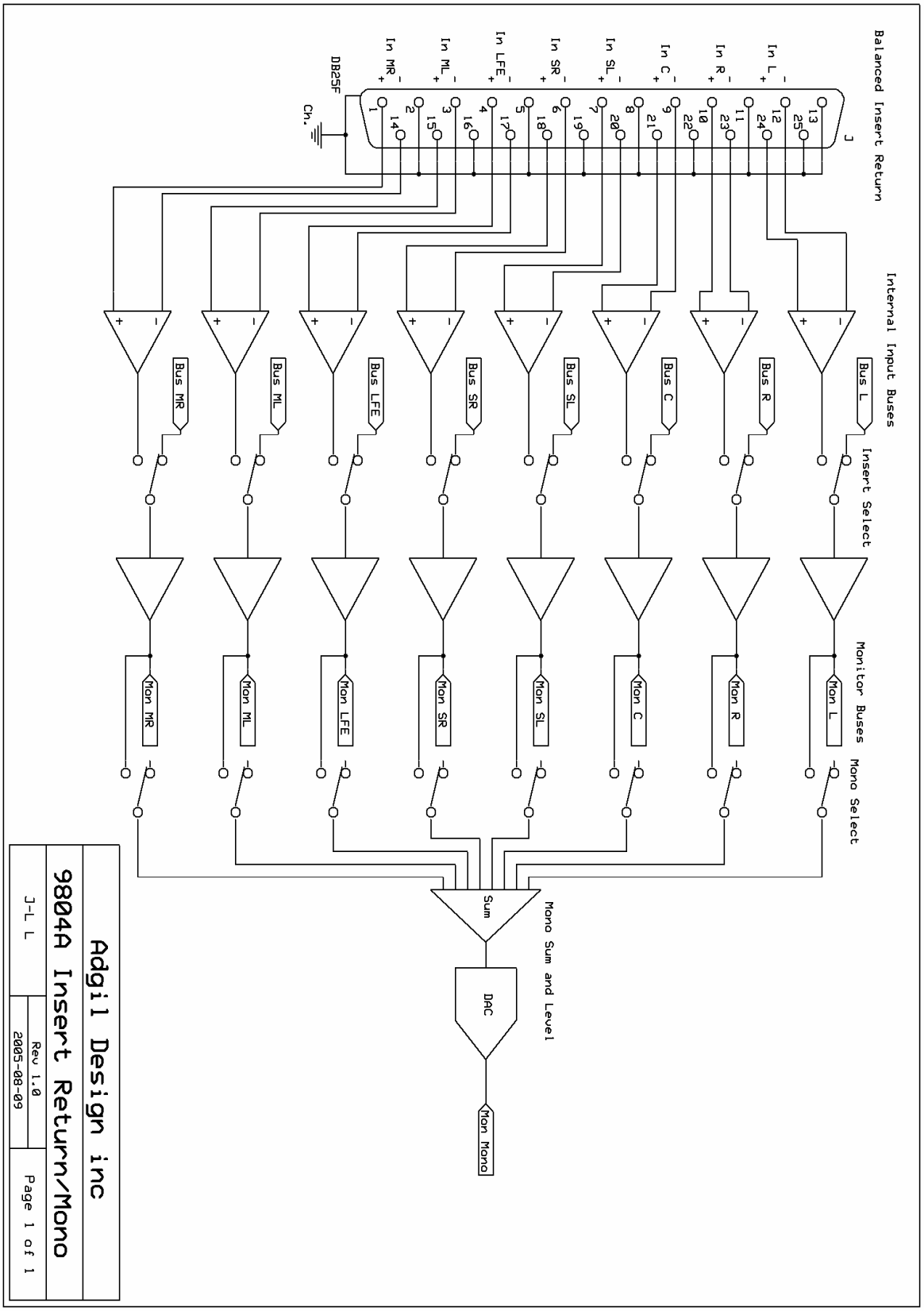
10.11 APPENDIX B – BUSS AMP / INSERT SEND



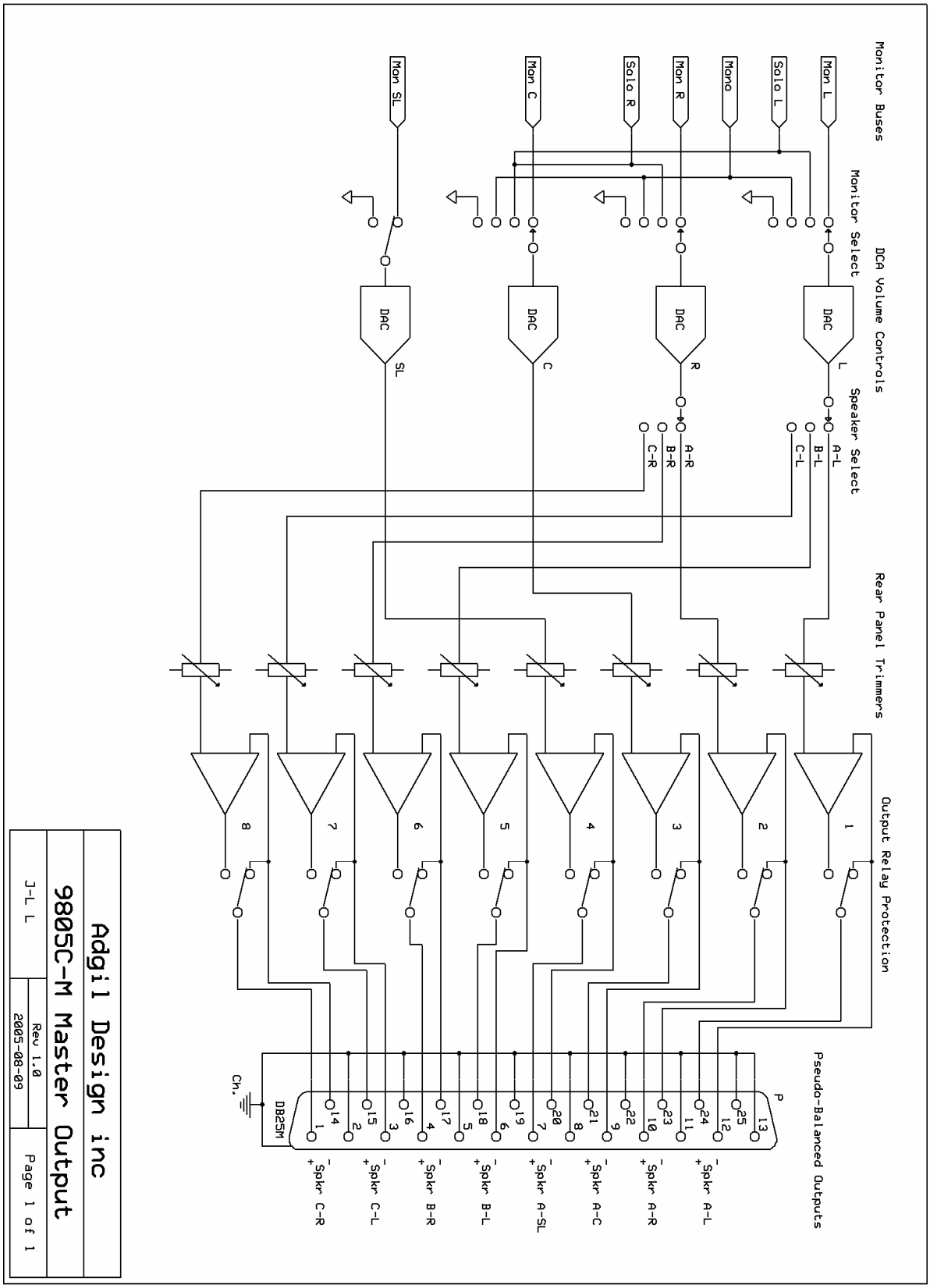
10.12 APPENDIX C – METER FEED



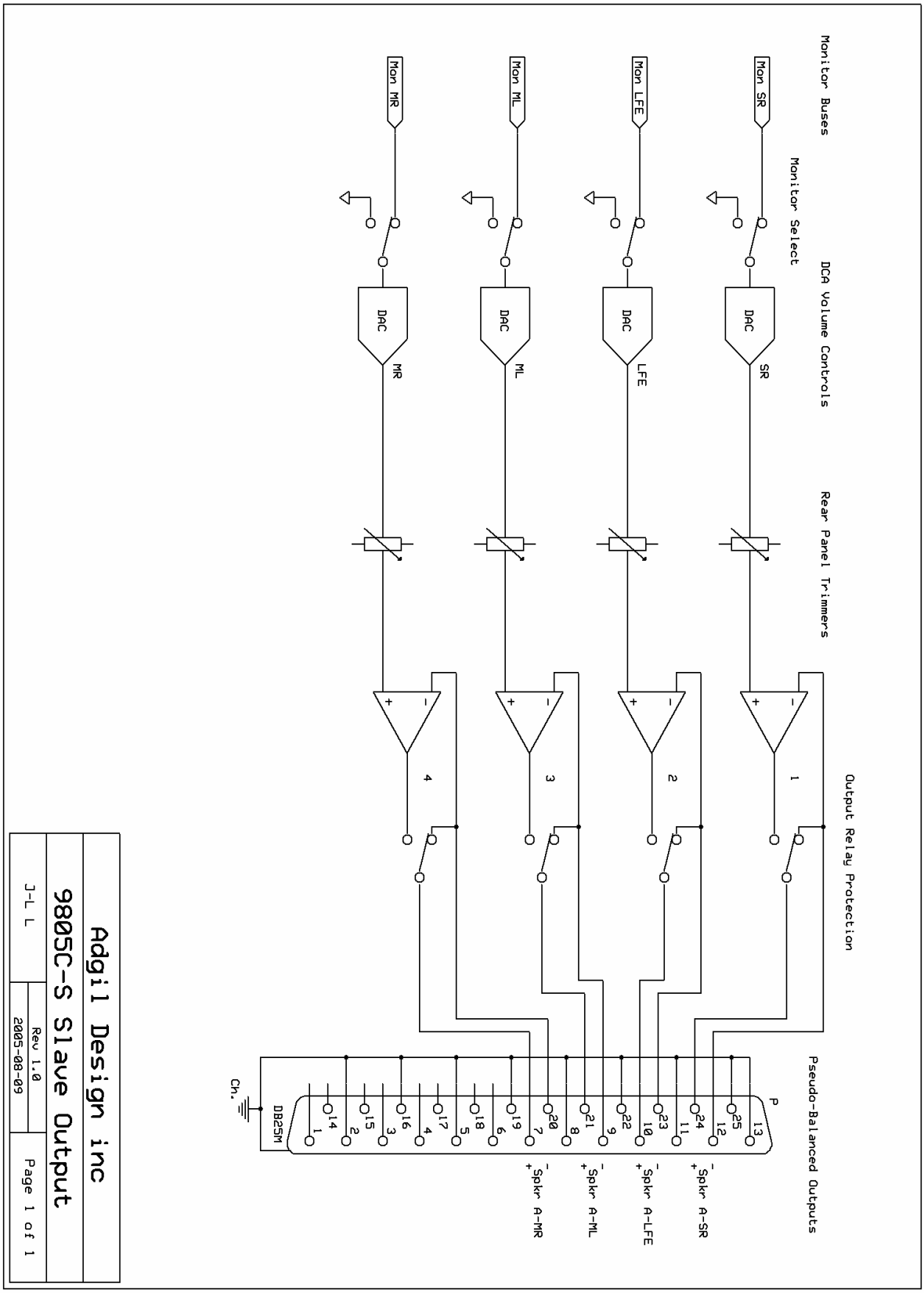
10.13 APPENDIX D – INSERT RETURN / MONO MIX



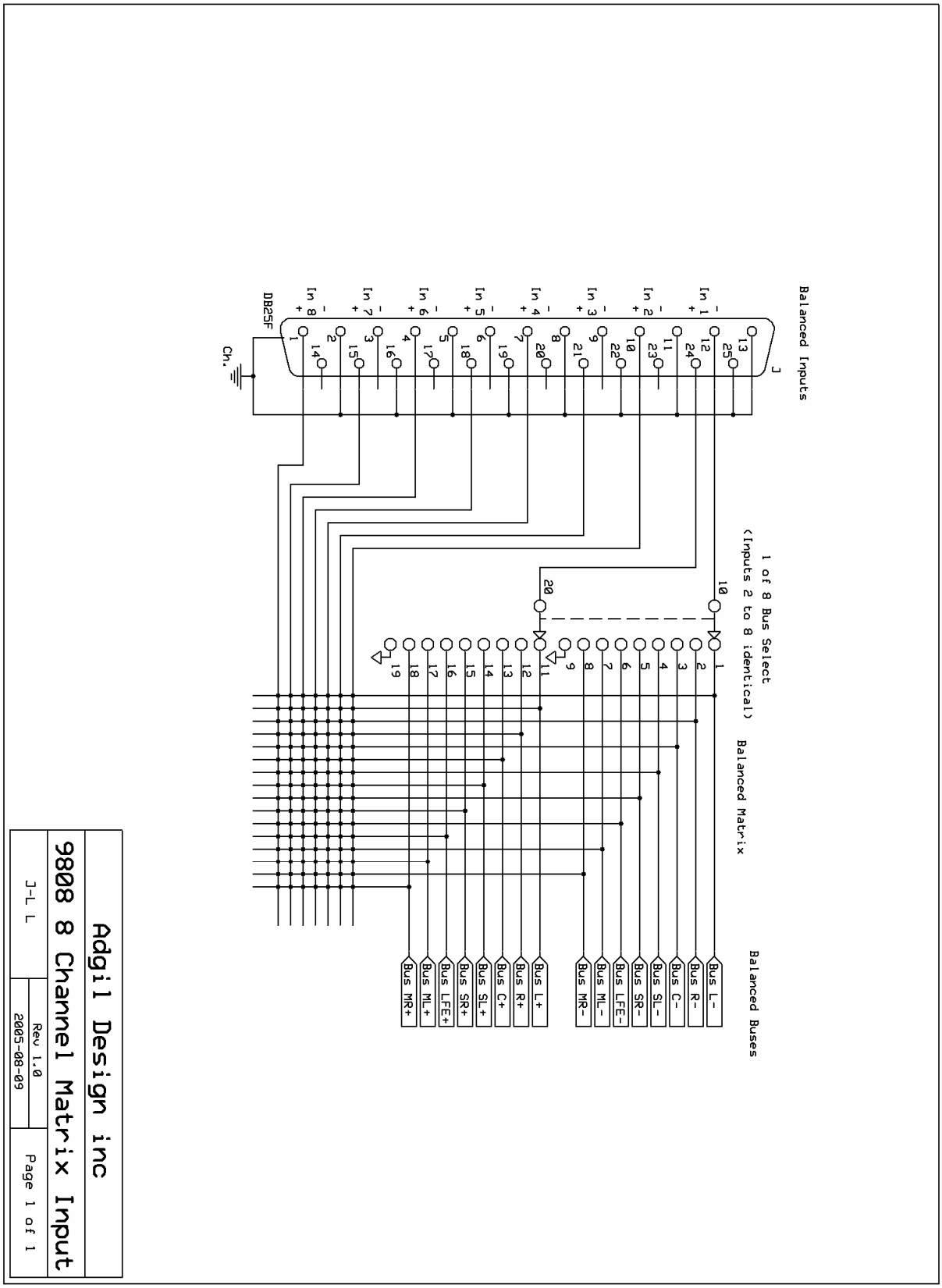
10.14 APPENDIX E – MASTER OUTPUT



10.15 APPENDIX F – SLAVE OUTPUT



10.16 APPENDIX G – MATRIX INTPUT



10.17 APPENDIX H – DOWNMIX / SOLO